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ABSTRACT

A manual was developed for use by the Rhode Island Department of Education to introduce the faculty of the William R. Davies, Jr. Career and Technical High School (Lincoln, Rhode Island) and other secondary schools to the rationale for integration of academic and vocational instruction. A literature review was conducted to provide a conceptual framework for the manual and to determine the type of content to be included. It addressed cognitive, economic, and social justice issues relevant to integration of academic and vocational instruction. A search for similar manuals found none. The manual created contains nine sections, eight of which are concerned with conceptual categories of information that would document and substantiate the rationale for integration of academic and vocational education. The nine sessions are: (1) The Carl D. Perkins Vocational and Applied Technology Act of 1990; (2) Global Competition; (3) The Changing Nature of Work; (4) American Education--How Our Students Perform; (5) New Cognitive Research and Implications for Vocational Education; (6) Employability Skills for the Changing Nature of Work; (7) Models for Integrating Vocational and Academic Education; (8) Specific Benefits of Integrated Curriculum; and (9) Conclusion. This report's five chapters discuss background and significance of the research; the literature review; the methodology used; the results obtained; and conclusions, implications, and recommendations. Appendixes, amounting to about one-third of the report, include a list of 16 references, validation letters, and the complete manual. (YLB)

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THE DEVELOPMENT OF AN INTEGRATED VOCATIONAL ACADEMIC INSTRUCTIONAL MANUAL FOR THE RHODE ISLAND DEPARTMENT OF EDUCATION

EMERGENCE OF VTO EDUCATION IN AMERICA SEMINAR

by

Beverly F. Lembo, M.Ed.

William M. Davies Jr. Career and Technical High School

U.S. DEPARTMENT OF EDUCATION
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A Practicum Report presented to Nova University in partial fulfillment of the requirements for the degree of Doctor of Education

Nova University

April, 1992

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THE DEVELOPMENT OF AN INTEGRATED VOCATIONAL ACADEMIC INSTRUCTION MANUAL FOR THE RHODE ISLAND DEPARTMENT OF EDUCATION

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Beverly F. Lembo

April, 1992

The purpose of this study was to develop a manual to be used by the Rhode Island Department of Education to introduce the faculty of the Davies School and other secondary schools to the rationale for integration of academic and vocational instruction. The problem which prompted this study was that many secondary education teachers in Rhode Island did not understand why integration of academic and vocational instruction was necessary and they did not understand the value of the approach.

The procedures used to facilitate the development of the manual were an extended review of literature, a search for manuals similar to the one that was composed and a review of the manual by two professionals.

The manual created as a result of this study contained nine sections: (1) The Carl D. Perkins Vocational and Applied Technology Act of 1990; (2) Global Competition; (3) The Changing Nature of Work; (4) American Education - How Our Students Perform; (5) New Cognitive Research and Implications for Vocational Education; (6) Employability Skills for the Changing Nature of Work; (7) Models for Integrating Vocational and Academic Education; (8) Specific Benefits of Integrated Curriculum and (9) Conclusion.

Conclusions drawn in the process of completing the study included; (1) A

clarification of the definition of integrated academic and vocational education was needed in the manual; (2) The first section of the manual had to document the major premise of the Carl D. Perkins Vocational and Applied Technology Act of 1990 which emphasizes vocational education as an educational delivery system - not a content area; (3) The next seven sections of the manual needed to establish the rationale for integrating academic and vocational education both from within and outside the institution.

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Chapter 1

INTRODUCTION

Background and Significance

William M. Davies Jr. Career and Technical High School (Davies) is the only comprehensive high school in Rhode Island offering both academic and vocational instruction in the same facility. At Davies, vocational and academic instruction have been taught primarily in isolation from each other. Students receive "hands-on," applied knowledge instruction in vocational subjects one week and academic instruction taught in a rote, sequential manner, devoid of any practical application the next week. What efforts have been made in the past to integrate were not rated as successful by the participating teachers at the Davies School. Historically, there has been very little collaboration between academic and vocational faculty at the Davies School.

The Rhode Island Department of Education, in response to new federal legislation, economic cognitive science and social justice issues, has made the integration of vocational and academic instruction a top priority. A problem exists in Rhode Island because many secondary education teachers do not understand why integration of academic and vocational instruction is necessary and they do not understand the value of the approach.

The purpose of this practicum, therefore, was to develop a manual to be used by the Rhode Island Department of Education to introduce the faculty of the Davies School and other secondary schools to the rationale for integration of academic and vocational instruction. It was anticipated that the manual would include content relevant to integration of academic and vocational instruction, including emerging job requirements, international competition,

current student performance, employer concerns, application and transfer of learning and federal legislation.

This practicum was directly related to the "Emergence of Vocational Technical and Occupational Education in America" seminar which focused on the demographic, social, economic, technological and political trends affecting vocational education. This practicum was appropriate and relevant to the latest reform movement in vocational education.

Research Question

The question for this developmental study was: What content should be included in the Rhode Island Department of Education's Integration of Academic and Vocational Education manual?

Chapter 2

REVIEW OF THE LITERATURE

A literature review was conducted to provide a conceptual framework for the manual and to determine the type of content to be included. "Integration of Academic and Vocational Education" was the descriptor used in the ERIC search. Relevant reports were obtained from the National Center on Education and the Economy and the Rhode Island Workforce 2000 Council. This literature was examined and divided into eight conceptual categories of information that would document and substantiate the rationale for integration of academic and vocational education.

The Carl D. Perkins Vocational and Applied Technology Act of 1990

The reauthorized Carl Perkins Act, effective July 1, 1991, enables Congress to spend up to $1.6 billion a year on state and local programs that teach the skill competencies necessary to work in a technically advanced society. The act reads as follows:

> It is the purpose of this act to make the United States more competitive in the world economy by developing more fully the academic and occupational skill of all segments of the population. This purpose will principally be achieved through concentrating resources on improving educational programs leading to academic, occupational, training, and re-training skill competencies needed to work in a technologically advanced society (American Vocational Association, 1990: 49).

The new law emphasizes vocational education as an educational delivery system--not a content area. The shift in the new law is away from the traditional job-skills orientation of vocational education to a broader purpose of reassessing vocational education as a method of learning academic skills and for connecting thought with action (Wirt, 1989).

The Carl D. Perkins Vocational and Applied Technology Act states mandates that the United States General Accounting Office (GAO) study implementation and effects of the new Perkins Act. Buzzel (1991) states:

> The results of the GAO study will have enormous impact on the scope of the next reauthorization. If the GAO should show that the vocational education enterprise, in its expenditure of federal dollars, has not produced the anticipated outcomes--primarily to show documented advances in basic skills, job skills, and job placement for special populations then the system will be judged to have failed.

Brand, Assistant Secretary of Education for Vocational and Adult Education, stated at the AVA National Convention on December 2, 1990, that the agency will require state administrators to be accountable for meeting established goals. Clearly, one of the goals of the 1991 Perkins Act is integration of academic and vocational education. Vocational educators will be held accountable for documented evidence of quality and compliance with that goal.

Global Competition

The Commission on the Skills of the American Workforce (1990), found that America faces an urgent choice; high skills or low wages. The Commission found that, in sharp contrast to our competitor nations in Europe and Asia, our economy has not been providing the kind of jobs that can support a better standard of living for the majority of Americans. Specifically;

1. United States productivity growth has slowed to a crawl during the past two decades.
2. U.S. workers' real weekly earnings have fallen 12% since 1969.
3. Wages in the U.S. are not growing nearly as fast as our competitors. From 1973-1988, wages in the U.S. increased an average of 6.2% a year; while European wages increased 8.3%, Japan 11.6%, and other Pacific Rim countries 14% a year.

Today, average hourly wages for production workers in the U.S. are less than many countries, including Germany and Sweden, and just above Japan's.

To change these conditions, the Commission on the Skills of the American Workforce (1990) identified several interrelated problems that must be fixed:

1. Our K-12 system has little incentive for students to succeed, and no guarantee of basic skills mastery.
2. We largely abandon drop-outs from this system.
3. Most students and workers flounder during the transition from school to work. We have no clear, comprehensive transition system from high school to productive work for the majority of students who aren't college bound.
4. Our worker training system for those who are outside the bounds of the college-prep system is very limited, fragmented, narrowly geared towards the disadvantaged, and lacks connection with the needs of the employers in the labor market.
5. Firms don't organize work for high quality, high performance production; production that demands higher skills on the part of workers.

The Commission identifies the integration of academic and vocational education as a condition that must be met in order to correct these problems.

The Changing Nature of Work

The changing nature of jobs of the future is that they will require workers with a much wider range of competencies and skills than before. The trans-

ition into a global, information-based economy has been accompanied by an increasing orientation toward jobs based on mental rather than physical activity.

Increased automation has reduced the need for supervision of entry-level workers. These workers are now expected to operate independently in roles that require problem-solving and decision-making skills.

Miller (1983) reports that the accelerating pace of technological advancement has made it less likely that workers will hold the same job throughout their working lives; and the increasing economic pressures brought to bear by a global economy have made it far less likely that workers will begin and end their working lives at the same organization. In several engineering fields and their support positions, the half-life of an individual's technical training is approximately ten years. American workers must engage in lifelong education in order to be effective in the workplace. Our educational system must not only teach the basic competencies, it must teach people to learn.

Raizen (1989) reports:

> Economists studying changes in the workplace have observed a shift from mass production to flexible production in both manufacturing and service industries (Bailey and Noyelle, 1988). They argue that this shift requires workers with a much wider range of competencies and skills than before.
>
> In both manufacturing and service industries, workers are increasingly being required to take more initiative and have a greater knowledge and better conceptual understanding of the overall process in which they are involved. Increasingly, teamwork is being used to increase productiviy where there is teamwork, workers must be able to perform a greater number of tasks, and interact with a wider variety of individuals.

Kolde (1991) states:

> As the economy has changed its focus from production to service to informative, the composition of the workforce has become increasingly diverse and the scope of required skills has expanded. To meet the needs of the workplace, education must change. The classroom of the future is one that integrates academic and technical knowledge and skills within an applied vocational model. This model makes good education and economic sense and will prove, as the history of education reform is written, to have a most valuable design.

American Education--How Our Students Peform

Evidence of America's education crisis is well documented. The Commission on the Skills of the American Workforce (1990) states, "Our front-line workers will not be able to compete in the economic arena because they are increasingly unable to compete in the educational arena."

Groff (1991) states, "Data clearly suggest the need for thinking strategically about education and training in the advanced technical era with some bold and creative ways for achieving greater equality of opportunity for all people through restructured establishments and entirely new learning paradigms."

Grubb and others (1990), at the National Center for Research in Vocational Education in The Cunning Hand, The Cultured Mind: Models for Integrating Vocational and Academic Education list eight models for restructuring vocational and academic education.

> Integrating academic and vocational education is not an end in itself. It provides instead a vision of improving education and a way of overcoming some deficiencies of the American high school, including those that developed as a result of the original division between academic and vocational subjects and the segregation of college-bound students from those bound for work.

They further report that recent cognitive evidence supports the conclusion that knowledge is often specific to a particular activity or area of expertise, and that for most people effective learning requires a context that matters to them.

New Cognitive Research and Implications for Vocational Education

Raizen (1989) summarized relevant evidence from recent cognitive science research about how people learn to be competent in their work and examined the implications for reform in vocational education. Raizen (1989) notes why schools are not succeeding:

1. Skills Hiearachies: It is not true that skills are like building blocks, that people must learn "the basics" before they can learn specific problem-solving skills, yet most of school-and-work based training operates on this assumption.

2. Skills Decomposition: Often, a skill is decomposed into subskills, and each subskill is practiced separately. But it is seldom true that learning each of the subskills separately produces competence in the skill itself.

3. Learning in Isolation: Skills are taught in isolation, with too little experience with their application or how they are used together in combination. Appropriate application of knowledge and skills is not automatic.

4. Separating "Learning to Know" and "Learning to Do": The assumption that academic learning and education for work are distinct and need to be separated is mistaken. There are no skills without a foundation of knowledge and no knowledge without associated applied skills.

5. Learning Out of Context: Knowledge and skills are taught in formal school setting - very unlike settings at work or in real life. This impedes the transfer of school learning to settings outside of the classroom.

Raizen (1989) notes what needs to be done:

1. Integrate learning of basic skills with learning about the devices, systems, procedures, decision rules, and social interactions characteristic of specific work setting and responsibilities.

2. Provide most education for work in settings that are or duplicate as closely as possible the work setting for which the individual is preparing, while insuring that the necessary guidance and tutoring is provided.

3. Ensure that the education being provided is not narrowly limiting in its scope.

4. Take into consideration the personal lives of the student or novice worker.

5. Provide the contextual featues that allow authentic activity. Much of what is learned in school may apply only to the ersatz activity, if it was learned through such activity.

Pea (1987:652) suggests that, in general, concepts, strategies, and skills should be taught "in a problem-solving context where their functions are rendered apparent. Such function presentations and the emphasis and learning by doing will make more likely that the knowledge will be accessed and transferred to new problems."

Raizen (1989) further reports:

> It has now been documented that people learn differently on the job and through experience than they do in traditional classroom settings. Evidence is further accumulating that the current distinction made between learning for knowledge and learning for doing is contrary to learning theory and is detrimental to instructional effectiveness. The underlying assumption that students will somehow be able to transfer isolated subtask skills, in which the emphasis has been upon satisfactory repetitive performance, to a wide variety of work situations is being challenged.

The inability of American students to perform well in any type of problem-solving assessment supports this rationale.

Employability Skills for the Changing Nature of Work

As businesses look for more efficient strategies to increase productivity, service and product quality, demands for a higher skilled workforce will increase. Employers need creative, flexible workers who have a broad range of interpersonal and managerial skills and can work on self-managed teams. Groupings of skills termed "employability skills" have been identified by Gainer (1988) and Lankard (1987).

The following strategies are suggested for incorporating employability skill development concepts in the classroom (Bishop and Lankard, 1987):

1. Demand Good Deportment in the Classroom: Initiate strict guidelines for tardiness, class cutting, and discipline.
2. Express Work Values Through Classroom Instruction: Promote and require timelines, effort, responsibility, and other values. Over 65 percent of studied employers were negatively affected by workers who did not try.
3. Encourage Self-Esteem in Students: Expect the best from students. Attitudes about self were reflected in applicants' non-verbal behaviors -- a factor influencing employer assessments.

4. Promote and Display a Positive Attitude in the Classroom: Attitude is an important part of a person's employability rating and can be improved with practice and effort.

5. Use Instructional Materials That Illustrate the Importance of Employability Skill Development: Provide examples of how having (or lacking) employability skills affects a person's ability to find, get, and keep a job.

Lankard (1990) states that the best results seem to be achieved when employability skill training is integrated with academic and vocational skill training, forming a set of five basic skills. In this way, the relevance of the five types of skills are interrelated and taught as basics to job market success. . .something in which the learner has a level of interest.

Models for Integrating Vocational and Academic Education

There are many approaches to integrating academic and vocational education. Grubb and others (1990), at the National Center for Research in Vocational Education have identified eight models of integration which differ widely in how they approach integration and in their purposes. The models include the following:

1. Incorporating Academic Competencies Into Vocational Courses: Schools have worked to incorporate more academic material into existing vocational courses.

2. Combining Academic and Vocational Teachers to Incorporate Academic Competencies Into Vocational Courses: A somewhat different approach has assigned academic teachers the responsibility of increasing the academic components of vocational programs. Academic teachers can then teach individual lessons or modules for vocational students, help vocational in-

structors to develop their own academic exercises, or pull students out of vocational classes to work on academic competencies. The crucial element in this approach (in contrast to the first model) is that the academic and vocational teachers collaborate in modifying vocational programs.

3. Making the Academic Curriculum More Vocationally Relevant: A third approach modifies the academic curriculum instead of vocational courses, by incorporating vocational applications and examples and reconfiguring academic courses so that the topics are more relevant to vocational students. A common approach has been to introduce specific courses: the "applied academics" courses including Principles of Technology, Applied Mathematics, and Applied Communications, as well as several others less commonly adopted.

4. Modifying Both Academic and Vocational Education and Curricula "Alignment": Another model combines elements from the preceding approaches, by using more occupationally-relevant material in academic courses and more academic education in vocational courses and then linking the two. This may happen when two or more teachers, from both the academic and the vocational sides, coordinate the content of what they teach at a particular time - what we term "horizontal alignment". In the best cases, this practice creates sequences of academic and vocational courses that reinforce each other - or "vertical alignment" - clarifying that integrating academic and vocational education is an activity that can consider entire programs rather than individual courses.

5. The Academy Model: Academies are schools-within-schools that typically include academic teachers in English, math, and science with a vocational instructor in a subject - like health, electronics, business, or agriculture - which gives focus to the Academy. Because these teachers stay with a group of students for all four courses, over two or three years, the possibilities for both horizontal alignment and vertical alignment are increased enormously. Academies also establish close relationships with particular firms operating in their occupational area, providing students with additional motivation, mentors, and internships.

6. Replacing Conventional Departments with Occupational Clusters: A few high schools have established departments organized around occupational clusters in place of conventional academic and vocational departments. Like the focus of each Academy on a particular occupational area, this facilitates cooperation among teachers and both horizontal and vertical alignment, and provides academic teachers with obvious vocational emphases to incorporate into their classes.

7. Single-Occupation High Schools: In a few cities single-occupation high schools exist. Like an academy or a single occupational-cluster department, these schools provide an obvious focus for efforts to integrate academic and vocational education and a culture in which the occupational content of coursework cannot be ignored.

8. Electing Career Paths or Occupational Majors: A final approach is to maintain conventional academic and vocational departments,

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but in addition to have students and teachers organized in "career paths" or occupational clusters. This creates a matrix structure, in which teachers participate in both department discussions about the content of particular academic and vocational courses, and in a career path grouping which can then develop coherent sequences of courses and coordinate particular courses in the career path. In addition, the career paths forces students to think harder about their occupational futures, supported by counselors, and they combine students from different backgrounds with very different occupational ambitions, reducing the usual segregation of college-bound and vocational students.

Specific Benefits of Integrated Curriculum

Kolde (1991) states that the benefits of integrated academic and vocational education include the following:

1. When academic and vocational instructors cooperate in the development of instructional materials, such as learning guides and job-plan sheets, the materials are better organized and of higher quality.

2. The cooperative effort of the academic and vocational instructors to integrate mathematics and science concepts into the technical applications makes the curriculum more rigorous and gives it greater continuity.

3. The application of both abstract and concrete approaches to learning enhances student knowledge.

4. The more intensified curriculum and the use of learning activity guides enable students to progress at their own pace.

5. The cooperatively developed materials help the students to be better prepared in class to complete tasks and solve problems.

6. When the instructional staff works together, the students benefit from having access to several experts rather than just one.

7. Students score higher on paper-and-pencil achievement tests and on tests of technical performance.

8. Students are more highly motivated and have lower rates of absenteeism.

An examination of the literature appeared to indicate that a wide variety of research data supported the integration of academic and vocational education. There appeared to be a need to consolidate the findings of this data into one document supporting the rationale for integration of academic and vocational education.

Chapter 3

METHODOLOGY AND PROCEDURES

The procedures used to complete this developmental study follow in chronological order.

A thorough search of the literature was completed to provide the conceptual framework for the manual. The search of the literature addressed cognitive, economic and social justice issues relevant to integration of academic and vocational instruction.

Input was sought from the Rhode Island Department of Education. In addition, a search for similar manuals was done through the National Network for Curriculum Coordination in Vocational and Technical Education. It was found that no other state Departments of Education has developed a similar manual.

A draft copy of the manual was developed. It included the economic, social justice and cognitive science rationales for integration of academic and vocational instruction.

The vocational education specialist from the Rhode Island Department of Education and the acting principal of the Davies School reviewed the manual for validation purposes. Revisions were not deemed necessary. The manual was then submitted to the Rhode Island Department of Education's Director of Vocational Education.

Assumptions

It was assumed in this study that the final product, the manual, would be used by the Rhode Island Department of Education and be distributed to the faculty of the Davies School. It was also assumed that the manual would increase the Davies staff's understanding of the need for integration of academic and vocational instruction.

Limitations

One of the limitations of this study was that the manual alone could not be expected to disperse criticism of integrated vocational and academic instruction. The manual was limited presenting the rationale for integration of academic and vocational instruction.

A second limitation of this study was that no other state Department of Education had developed a similar manual.

Definition

For the purposes of this practicum, the term "integration of academic and vocational instruction" was defined as: the using of vocational education as a method for learning academic skills and for connecting thought with action. This definition was broad enough to be used in at least nine different models of integration.

Chapter 4

RESULTS

An extensive literature review was completed. The literature review section of the practicum was organized into eight sections: (1) The Carl D. Perkins Vocational and Applied Technology Act of 1990; (2) Global Competition; (3) The Changing Nature of Work; (4) American Education - How Our Students Perform; (5) New Cognitive Research and Implications for Vocational Education; (6) Employability Skills for the Changing Nature of Work; (7) Models for Integrating Vocational and Academic Education; and (8) Specific Benefits of Integrated Curriculum. The literature review provided the conceptual framework for the manual as well as the identification of content to be included.

Section one; the Carl D. Perkins Vocational and Applied Technology Act was derived from careful examination of the American Vocational Associations Guide to the Carl D. Perkins Vocational and Applied Technology Education Act of 1990 and statements made by Betsy Brand, Assistant Secretary of Education for Vocational and Adult Education at the AVA National Convention 1991. It was discovered that:

1. The purpose of the Perkins Act of 1990 was to make the United States more competitive in the world economy by developing more fully the academic and occupational skill of all segments of the population.
2. The new law emphasizes vocational education as an educational delivery system - not a content area.
3. One of the goals of the 1991 Perkins Act is integration of academic and vocational education.

4. Vocational education will be held accountable for documented evidence of quality and compliance with that goal.

Sections relating to Global Competition, The Changing Nature of Work and American Education - How Our Students Perform resulted in the following findings:

1. In sharp contrast to our competitor nations in Europe and Asia, our economy has not been providing the kind of jobs that can support a better standard of living for the majority of Americans.
2. Economists studying changes in the workplace have observed a shift from mass production to flexible production in both manufacturing and service industries. This shift required workers with a much wider range of competencies and skills than before.
3. Increasingly, teamwork is being used to increase productivity. Workers must be able to perform a greater number of tasks, and interact with a wider variety of individuals.
4. The integrated academic and technical model with an applied vocational setting makes good education and economic sense.
5. Our front line workers will not be able to compete in the economic arena because they are increasingly unable to compete in the educational arena.

Sections relating to New Cognitive Research and Implications for Vocational Education, Employability Skills for the Changing Nature of Work, Models for Integrating Vocational and Academic Education and Specific Benefits of Integrated Curriculum indicate that:

1. Evidence is accumulating that the current distinction made between learning for knowledge and learning for doing is contrary to learning theory and is detrimental to instructional effectiveness.

2. Employability skill training is best achieved when it is integrated with academic and vocational training, forming a set of five basic skills.

3. There are nine or more identified models of integrating academic and vocational education.

A wide variety of research data supported the integration of academic and vocational education. There appeared to be a need to consolidate the findings into one document. A manual was developed. It was submitted to the Rhode Island Department of Education's vocational education specialist and the acting director of the Davies School for review. The manual was deemed acceptable as written.

The completed manual was validated by the vocational education specialist for the Rhode Island Department of Education and the acting director of the Davies School. The final product was submitted to the Director of Vocational Education in Rhode Island for implementation.

Chapter 5

DISCUSSION, CONCLUSIONS, IMPLICATIONS AND RECOMMENDATIONS

Discussion

The results of the practicum were related to the purpose which was to develop a manual to introduce Davies faculty to the rationale for the integration of academic and vocational education. An extensive review of the literature was necessary in order to identify and examine the most significant issues relevant to the rationale for integrating academic and vocational education.

The literature review provided information about nine different models for the integration of academic and vocational education. It became apparent that a definition of integrated academic and vocational education was needed that could be applied to all nine models of integration.

The literature review also provided the conceptual framework for the eight sections of the manual. The Carl D. Perkins Vocational and Applied Technology Education section highlighted a shift in the new law away from the traditional job skills orientation of vocational education to a broader purpose of reassessing vocational education as a method for learning academic skills and for connecting thought with action. The next five sections, Global Competition, The Changing Nature of Work, American Education - How Our Students Perform, New Cognitive Research and Implications for Vocational Education and Employability Skills for the Changing Nature of Work were identified in the literature review as the most significant factors in the rationale for integrating academic and vocational instruction.

The models for Integrating Vocational and Academic Education section were included because it became apparent in the literature review that there were

multiple models for integrating curriculum with specific strengths and weaknesses inherent in each.

In the last section, Specific Benefits of Integrated Curriculum summarized the outcomes of integrated academic and vocational education revealed by the review of the literature.

The choice of high skills or low wages was well documented in the literature. The need for integration of academic and vocational education was supported in recent cognitive science research. Integration of academic and vocational instruction appeared to be a key factor in improving the quality and equality of education and work for all students.

Conclusions

The research question in this developmental study was: What content should be included in the Rhode Island Department of Education's integration of academic and vocational education manual?

The following conclusions were drawn from the study: (1) a clarification of the definition of integrated academic and vocational education was needed in the manual; (2) the first section of the guide had to document the major premise of the Carl D. Perkins Vocational and Applied Technology Act of 1990 which emphasizes vocational education as an educational delivery system - not a content area; (3) the next seven sections of the manual needed to establish the rationale for integrating academic and vocational education both from within and outside the institution.

Implications

Implications that were apparent from the conclusions drawn in this study included the following: (1) that the Carl D. Perkins Act requires integration of academic and vocational education and that educators will be held accountable for documented evidence of quality and compliance with that goal; (2) that the

design and development of human resource systems in the United States will be critical to the United States's ability to compete in the global economy; (3) that the changing nature of work requires that our educational system must not only teach the basic competencies, it must teach people to learn; (4) that America's education system is in crisis; (5) that recent cognitive research suggests that in general, concepts, strategies, and skills should be taught in a problem-solving context where their functions are rendered apparent and that emphasis on learning by doing will make more likely that knowledge will be accessed and transferred to new problems; (6) that "employability skills" including individual competence, personal reliability skills, economic adaptability skills, group and organizational effectiveness skills can best be achieved when employability skill training is integrated with academic and vocational skill training forming a set of five basic skills; and (7) that integration of academic and vocational education is a key factor in improving the quality and equality of education and work for all students.

Recommendations

The following recommendations were made as a direct result of this practicum:

1. It is recommended that information contained in this practicum be disseminated to individuals in Rhode Island's area centers and the Davies faculty.
2. It is also recommended that the information contained in this practicum be considered in the development of specifications for the integration of academic and vocational curriculum at the Davies School.
3. It is recommended that education provided at Davies should not be narrowly limiting int its scope.

4. It is recommended that, in general, concepts, strategies and skills at Davies should be taught in a problem-solving context where their functions are rendered apparent.

5. It is recommended that academic and vocational education at Davies should be integrated.

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THE RATIONALE FOR INTEGRATING ACADEMIC AND VOCATIONAL EDUCATION

By

Beverly Lembo

William M. Davies, Jr. Career and
Technical High School

April, 1992

INTRODUCTION

Congress has called for the integration of academic and vocational education. The recently amended Carl D. Perkins Vocational and Applied Technology Act has as a major premise the integration of academic and vocational education. In May 1990, at a conference titled "The Quality Connection: Linking Education and Work", jointly sponsored by the Department of Labor and the Department of Education. Each of the keynote speakers emphasized that the integration of academic and vocational education is imperative.

The purpose of this manual is to examine the rationale for integration of academic and vocational instruction and to present the most recent research findings relevant to cognitive science, economic, and social justice issues addressed in the integration of academic and vocational instruction.

For the purposes of this manual, the term "integration of academic and vocational instruction" is defined as "the using of vocational education as a method for learning academic skills and for connecting thought with action.

THE CARL D. PERKINS VOCATIONAL and APPLIED TECHNOLOGY EDUCATION ACT OF 1990

The reauthorized Carl Perkins Act, effective July 1, 1991, enables congress to spend up to $1.6 billion a year on state and local programs that teach the "skill competencies necessary to work" in a technically advanced society. The act reads as follows: "It is the purpose of this act to make the United States more competitive in the world economy by developing more fully the academic and occupational skill of all segments of the population. This purpose will principally be achieved through concentrating resources on improving educational programs leading to academic, occupational, training, and re-training skill competencies needed to work in a technologically advanced society." (American Vocational Association, 1990).

The new law emphasizes vocational education as an educational delivery system - not a content area. The shift in the new law is away from the traditional job-skills orientation of vocational education to a broader purpose of reassessing vocational education as a method for learning academic skills and for connecting thought with action (Wirt 1989).

The Carl D. Perkins Vocational and Applied Technology Act mandates that the United States General Accounting Office (GAO) study implementation and effects of the new Perkins Act. Buzzel (1991) states:

> The results of the GAO study will have enormous impact on the scope of the next reauthorization. If the GAO should show that the vocational education enterprise, in its expenditure of federal

dollars, has not produced the anticipated outcomes - primarily to show documented advances in basic skills, job skills, and job placement for special populations then the system will be judged to have failed.

Betsy Brand, Assistant Secretary of Education for Vocational and Adult Education, stated at the AVA National Convention on December 2, 1991, that the agency will require state administrators to be accountable for meeting established goals. Clearly, one of the goals of the 1991 Perkins Act is integration of academic and vocational education. Vocational educators will be held accountable for documented evidence of quality and compliance with that goal.

Buzzel (1990) states: Section 611, pages 170-172 of the AVA Guide calls for the GAO to conduct a thorough study of the "dual system of vocational education in the Federal Republic of Germany, including an analysis of the desirability, advantages, and disadvantages of establishing a national job apprenticeship program in the United States similar to the German system."

Buzzel (1990) questions whether Congress may be anticipating that vocational education will fail in its Perkins mission, and that by having a GAO assessment of the German apprenticeship system at hand, Congress is covering its bets. The question then arises, if America's vocational education is not up to the task assigned, why not try the German model?

GLOBAL COMPETITION

America is embarking on a third industrial revolution. As America enters the advanced technical era, higher skills and higher performance of its workers will be required if it is to maintain high living standards while competing with low wage nations.

The commission on the Skills of the American Workforce (1990) notes that Germany, Japan, Sweden, Denmark, and other advanced industrial countries face the same challenge. Unlike German and Japan, the United States has a negative trade balance of more than $100 billion annually for the past six years. Germany and Japan have enjoyed positive balances.

While each of these nations has maintained higher rates of productivity growth than the United States, the United States has slipped into a position of taking three years to achieve gains in productivity that it used to achieve in one pre-1973 year (National Center on Education and the Economy 1990). In recent years, the United States' economy has grown because of increases in the labor force, not because of productivity. Groff (1990) notes:

> Industrial nations and newly industrialized countries of world are passing through the early technical era to an advanced technical era. In addition, many nations and countries are restructuring economic and political systems. The global, economic, political, and technological restructuring will impact each nation and all people. Several newly industrialized nations, mostly on the Pacific Rim, have a distinct advantage in that they are now entering the expansion of education stage that the United States experienced several decades ago. In preparation for such expansion, these countries are auditing their existing system and assessing Human Resource Development (HRD) policy, philosophy, and systems in developed nations around the world to build on strengths. These countries are designing human resource development systems based on the principles of an advanced technical area.

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THE CHANGING NATURE OF WORK

The changing nature of jobs of the future is that they will require workers with a much wider range of competencies and skills than before. The transition into a global, information-based economy has been accompanied by an increasing orientation toward jobs based on mental rather than physical activity.

Increased automation has reduced the need for supervision of entry-level workers. These workers are now expected to operate independently in roles that require problem-solving and decision-making skills.

Miller (1983) reports that the accelerating pace of technological advancement has made it less likely that workers will hold the same job throughout their working lives; and the increasing economic pressures brought to bear by a global economy have made it far less likely that workers will begin and end their working lives at the same organization. In several engineering fields and their support positions, the half-life of an individual's technical training is approximately ten years. American workers must engage in lifelong education in order to be effective in the workplace. Our educational system must not only teach the basic competencies, it must teach people to learn.

Raizen (1989) reports:

> Economists studying changes in the workplace have observed a shift from mass production to flexible production in both manufacturing and service industries (Bailey 1988; Novelle 1989). They argue that this shift requires workers with a much wider range of competencies and skills than before.
>
> In both manufacturing and service industries, workers are increasingly being required to take more initiative and have a greater knowledge and better conceptual understanding of the

overall process in which they are involved. Increasingly, teamwork is being used to increase productivity where there is teamwork, workers must be able to perform a greater number of tasks, and interact with a wider variety of individuals.

Kolde (1991) states:

> As the economy has changed its focus from production to service to informative, the composition of the workforce has become increasingly diverse and the scope of required skills has expanded. To meet the needs of the workplace, education must change. The classroom of the future is one that integrates academic and technical knowledge and skills within an applied vocational model. This model makes good education and economic sense and will prove, as the history of education reform is written, to have been a most valuable design.

AMERICAN EDUCATION - HOW OUR STUDENTS PERFORM

One of the national goals for education by the year 2000 is that "every adult American will be literate and will possess the skills necessary to compete in a global economy." The education system we now have has not met the needs of our youth nor our businesses. As many as 70,000,000 American adults lack sufficient reading, writing, and math skills to make correct ledger entries, follow a manual's directions, locate a place on a map, or fill out a job application. Lee Iacocca, Chrysler's Chairman, told the National Education Association meeting in San Diego last March, that "our drop-out rate is a tragedy, but a bigger tragedy is the number of high school graduates who can barely read their diploma - 600,000 people like that graduated last year." Iacocca's estimate of 600,000 functionally illiterate high school graduates in 1988 may be low (estimates run as high as 700,000 - nearly twenty percent of those graduating). Evidence of America's education crises is overwhelming:

* Fifty-eight percent of all 17-year olds in the United States cannot calculate the area of a square, given the length of one side.
* Sixty percent of America's 13-year olds cannot determine how much change is due them after purchasing two items in a supermarket.
* One-in-six college freshmen in the United States is enrolled in a remedial reading course; one-in-five in a remedial writing course; one-in-four in a remedial math course.

* The verbal SAT scores of high school seniors declined to an all time low this year and mathematics scores fell for the first time since 1988.
* Recent studies of the mathematics proficiency of students in twenty countries produced the following ratings for United States students:
    * Statistics: 8th
    * Arithmetics: 10th
    * Algebra: 12th
    * Geometry: 16th
    * Measurements: 18th
* In a comparison of student proficiency in the basic sciences, the results were similar. Among students from thirteen countries, United States students ranked as follows:
    * Physics: 9th
    * Chemistry: 11th
    * Biology: 13th
* America has a high school drop-out rate that averages twenty-five percent and climbs to forty percent or fifty percent in many cities.
* Of those students who have not dropped out, at least two-thirds of the students are cognitively and emotionally disengaged from their learning.
* Analysis indicates that 65 percent of inner city school children may be at risk.

Global economic competition has made the need to improve the American workforce very clear. "Our front-line workers will not be able to compete in the economic arena because they are increasingly unable to compete in the educational arena." (Commission on the Skills of the American Workforce, 1990). Groff (1991) states:

> Vocational, technical, and occupational (VTO) education is at a crossroads. VTO education in the United States was conceived and developed for an industrial society. During the 1990s, the United States and other nations will move into an advanced technical society. VTO must be restructured to reflect the society of which it is a part. More importantly, however, VTO must be restructured to be reflective of the evolving advanced technical era. Data clearly suggests the need for thinking strategically about education and training in an advanced technical era with some bold and creative ways for achieving greater equality of opportunity for all people through restructured establishments and entirely new learning paradigms.

NEW COGNITIVE RESEARCH AND IMPLICATIONS FOR VOCATIONAL EDUCATION

Senta Raizen (1989) summarized relevant evidence from recent cognitive science research about how people learn to be competent in their work and examined the implications for reform in vocational education. Raizen (1989) notes why schools are not succeeding:

1. Skills Hierarchies: It is not true that skills are like building blocks, that people must learn "the basics" before they can learn specific problem-solving skills, yet most of school-and-work-based training operates on this assumption.
2. Skills Decomposition: Often, a skill is decomposed into subskills, and each subskill is practiced separately. But it is seldom true that learning each of the subskills separately produces competence in the skill itself.
3. Learning in Isolation: Skills are taught in isolation, with too little experience with their application or how they are used together in combination. Appropriate application of knowledge and skills is not automatic.
4. Separating "Learning to Know" and "Learning to Do": The assumption that academic learning and education for work are distinct and need to be separated is mistaken. There are no skills without a foundation of knowledge and no knowledge without associated applied skills.
5. Learning Out of Context: Knowledge and skills are taught in a setting that a formal school - very unlike settings at work or in real life. This impedes the transfer of school

learning to settings outside the classroom.

Raizen (1898) notes what needs to be done:

1. Integrate learning of basic skills with learning about the devices, systems, procedures, decision rules, and social interactions characteristic of specific work setting and responsibilities.
2. Provide most education for work in settings that are or duplicate as closely as possible the work setting for which the individual is preparing, while insuring that the necessary guidance and tutoring is provided.
3. Ensure that the education being provided is not narrowly limiting in its scope.
4. Take into the personal lives of the student or novice worker and recognize interrelationships that exist between healthy families, schools that educate, and productive workplace.
5. Provide the contextual features that allow authentic activity. At the same time, students may come to rely on important but little noticed ways, on features of the classroom context, in which the task is now embedded, that are wholly absent from the alien to authentic activity. Thus much of what is learned in school may apply only to the ersatz activity, if it was learned through such activity (p. 34).

Raizen further reports:

> It has now been documented that people learn differently on the job and through experience than they do in traditional classroom settings. Evidence is further accumulating that the current distinction made between learning for knowledge and learning for doing is contrary to learning theory and is detrimental to instructional effectiveness. The underlying assumption that students will somehow be able to transfer isolated

subtask skills in which the emphasis has been upon satisfactory repetitive performance, to a wide variety of work situations is being challenged.

The inability of American students to perform well in any type of problem-solving assessment supports this rationale. Raizen notes:

> Carraher, Carraher, and Schliemann (1985) studied the computational skills of children who sell things in street markets of Recife, Brazil. These children accurately make frequent and quite complex mental calculations connected with their commercial transactions, but failed the same problems in a formal school - type test where paper and pencil were used. The authors concluded that "daily" problem solving may be accomplished by routines different from those taught in schools ... attempts to follow school - prescribed routines seemed to interfere with problem solving (p. 28). These researchers see their results as providing evidence for the thesis of Lauria (1976) and Donaldson (1978) that "thinking sustained by daily human sense can be - in the same subject - at a higher level than thinking out of context" (p. 27).

> Resnick (1987 a): Evidence is beginning to accumulate that traditional schooling's focus on individual, isolated activity, on symbols correctly manipulated but divorced from experience, and on decontextualized skills may be partly responsible for the school's difficulty in promoting its own in-school learning goals (p. 18).

> Sticht, Armstrong, Hicky, and Coylor, 1987: Expert electronics technicians draw as much on their understanding of equipment as functional systems as they do on traditional basic electricity and electronics theory ... Basic skill (literacy, mathematics, problem solving, troubleshooting) are interrelated capabilities that draw upon a common knowledge base in a person's mind. Hence, improvements in basic skills can be accomplished by improving a student's knowledge in a domain area (Sticht, 1987, section 5.4). Sticht (1987, section 5.13) concludes that effective courses use the knowledge that students bring with them to build new knowledge. Integrate the instruction in domain specific knowledge and skills with reading, writing, arithmetic, and problem solving rather than offering decontextualized basic skills remedial programs; [and] use learning context, tasks, materials, and procedures that mirror as closely as possible subsequent work tasks and situations, so that students are clear about what they are to learn and why; [and] how the knowledge and skills they are acquiring will be applied.
> acquiring will be applied.

> Brown (1989): Students need much more than abstract concepts and self-contained examples. They need to be exposed to the use of a domain's conceptual tools in authentic activity, to teachers acting as practitioners, and using these tools in wrestling with

problems of the world ... classroom tasks ... can completely fail to provide the contextual features that allow authentic activity. At the same time, students may come to rely in important but little noticed ways, on features of the classroom context, in which the task is now embidded, that are wholly absent from and alien to authentic activity. Thus, much of what is learned in school may apply only to the visatz activity, if it was learned through such activity (p. 34).

Pea (1987) suggests that in general, concepts, strategies, and skills should be taught in a problem-solving context where their functions are rendered apparent. Such functional presentations and the emphasis on learning by doing will make more likely that the knowledge will be accessed and transferred to new problems" (p. 652).

EMPLOYABILITY SKILLS FOR THE CHANGING NATURE OF WORK

As businesses look for more efficient strategies to increase productivity, service, and product quality, demands for a higher skilled workforce will increase. Employers need creative, flexible workers who have a broad range of interpersonal and managerial skills and can work on self-managed teams. A grouping of skills termed "Employability Skills" was summarized by Gainer (1988) as follows:

* Individual Competence: Communication skills, comprehension, computation, and culture.
* Personal Reliability Skills: Personal management, ethics, and vocational maturity.
* Economic Adaptability Skills: Problem solving, learning, employability, and career development.
* Group and Organizational Effectiveness Skills: Interpersonal skills, organizational skills, and skills in negotiation, creativity, and leadership

Lankard (1987) identifies seven categories of employability skills and offers competency-based training modules for each. These categories and related modules are as follows:

* Present a Positive Image: Follow good grooming practices, practice good health habits, dress appropriately for the job, exhibit self-confidence.
* Exhibit Positive Work Attitudes: Use basic social skills, be creative and willing to learn, take pride in your work.
* Practice Ethical Behavior: Exercise integrity and good

judgment, respect property, follow company rules.

* Practice Good Work Habits: Maintain regular attendance, be thorough and diligent, follow safety practices.
* Communicate Effectively: Demonstrate speech, writing, and non-verbal communication skills; demonstrate good listening skills.
* Accept Responsibility: Use initiative, problem-solving techniques, manage personal responsibilities, cooperate with others, work as a member of a team, work under supervision.

The following strategies are suggested for incorporating employability skill development concepts in the classroom (Bishop and Lankard 1987):

* Demand Good Deportment in the Classroom: Initiate strict guidelines for tardiness, class cutting, and discipline.
* Express Work Values Through Classroom Instruction: Promote and require timelines, effort, responsibility, and other values. Over 65 percent of studied employers were negatively affected by workers who did not try.
* Encourage Self-Esteem in Students: Expect the best from students. Attitudes about self were reflected in applicants' non-verbal behaviors -- a factor influencing employer assessments.
* Promote and Display a Positive Attitude in the Classroom: Attitude is an important part of a person's employability rating and can be improved with practice and effort.
* Use Instructional Materials That Illustrate the Importance of Employability Skill Development: Izzo and Lankard (1987)

provide examples of how having (or lacking) employability skills affects a person's ability to find, get, and keep a job.

Lankard (1990) states that the best results seem to be achieved when employability skill training is integrated with academic and vocational skill training, forming a set of five basic skills. In this way, the relevance of the five types of skills are interrelated and taught as basics to job market success...something in which the learner has a level of interest.

MODELS FOR INTEGRATING VOCATIONAL AND ACADEMIC EDUCATION

There are many approaches to integrating academic and vocational education. Grubb and others (1990), at the National Center for Research in Vocational Education have identified eight models of integration which differ widely in how they approach integration and in their purposes. The models include the following:

1. Incorporating Academic Competencies Into Vocational Courses: Schools have worked to incorporate more academic material into existing vocational courses.

2. Combining Academic and Vocational Teachers to Incorporate Academic Competencies Into Vocational Courses: A somewhat different approach has assigned academic teachers the responsibility of increasing the academic components of vocational programs. Academic teachers can then teach individual lessons or modules for vocational students, help vocational instructors to develop their own academic exercises, or pull students out of vocational classes to work on academic competencies. The crucial element in this approach is that academic and vocational teachers collaborate in modifying vocational programs.

3. Making the Academic Curriculum More Vocationally Relevant: A third approach modifies the academic curriculum instead of vocational courses, by incorporating vocational applications and examples and reconfiguring academic courses so that the topics are more relevant to vocational students. A common approach has been to introduce specific courses: the "applied academics" courses including Principles of Technology, Applied

Mathematics, and Applied Communications, as well as several others less commonly adopted.

4. Modifying Both Academic and Vocational Education and Curricula "Alignment": Another model combines elements from the preceding approaches, by using more occupationally-relevant material in academic courses and more academic education in vocational courses and then linking the two. This may happen when two or more teachers, from both the academic and the vocational sides coordinate the content of what they teach at a particular time - what we term "horizontal alignment". In the best cases, this practice creates sequences of academic and vocational courses that reinforce each other - or "vertical alignment" - clarifying that integrating academic and vocational education is an activity that can consider entire programs rather than individual courses.

5. The Academy Model: Academies are schools-within-schools that typically include academic teachers in English, math, and science with a vocational instructor in a subject - like health, electronics, business, or agriculture - which gives focus to the Academy. Because these teachers stay with a group of students for all four courses, over two or three years, the possibilities for both horizontal alignment and vertical alignment are increased enormously. Academies also establish close relationships with particular firms operating in their occupational area, providing students with additional motivation, mentors, and internships.

6. Replacing Conventional Departments With Occupational Clusters:

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A few high schools have established departments organized around occupational clusters in place of conventional academic and vocational departments. Like the focus of each Academy on a particular occupational area, this facilitiates cooperation among teachers and both horizontal and vertical alignment, and provides academic teachers with obvious vocational emphases to incorporate into their classes.

7. Single-Occupation High Schools: In a few cities single-occupation high schools exist. Like an academy or a single occupational-cluster department, these schools provide an obvious focus for efforts to integrate academic and vocational education and a culture in which the occupational content of coursework cannot be ignored.

8. Electing Career Paths or Occupational Majors: A final approach is to maintain conventional academic and vocational departments, but in addition to have students and teachers organized in "career paths" or occupational clusters. This creates a matrix structure, in which teachers participate in both department discussions about the content of particular academic and vocational courses, and in career path groupings which can then develop coherent sequences of courses and coordinate particular courses in the career path. In addition, the career paths forces students to think harder about their occupational futures, supported by counselors, and they combine students from different backgrounds with very different occupational ambitions, reducing the usual segregation of college-bound and vocational students.

SPECIFIC BENEFITS OF INTEGRATED CURRICULUM

Kolde (1991) states that the benefits of integrated academic and vocational education include the following:

* When academic and vocational instructors cooperate in the development of instructional materials, such as learning guides and job-plan sheets, the materials are better organized and of higher quality.

* The cooperative effort of the academic and vocational instructors to integrate mathematics and science concepts into the technical applications makes the curriculum more rigorous and gives it greater continuity.

* The application of both abstract and concrete approaches to learning enhances student knowledge.

* The more intensified curriculum and the use of learning activity guides enable students to progress at their own pace.

* The cooperatively developed materials help the students to be better prepared in class to complete tasks and solve problems.

* When the instructional staff works together, the students benefit from having access to several experts rather than just one.

* Students score higher on paper-and-pencil achievement tests and on tests of technical performance.

* Students are more highly motivated and have a lower rate of absenteeism (Kolde 1991).

CONCLUSION

America has a high school drop-out rate of twenty percent and as much as fifty percent in some inner city schools. Students that are non-college bound are often not prepared for life or the world of work. They are offered courses that are undemanding and that are presented in a theoretical rather than applied manner. Consequently, as many as 700,000 high school graduates last year could barely read their diplomas.

The Commission on the Skills of the American Workforce (1990) states the prospects of America's non-college bound youth as follows: "There is no curriculum to meet these youngsters' needs, no real employment service for those who go right to work, few guidance services for them, no certification of their accomplishment, no rewards in the workplace for hard work in school, and no sign of real respect. Virtually everything in their environment tells them that they are nothing..."

The William T. Grant Foundation Commission on Work, Family and Citizenship concluded "...our economy is being damaged and, more importantly, young lives are being damaged, by our collective failure to help young people make a smoother transition from school to work."

The need for integration of academic and vocational education is well documented in recent cognitive science research. America has a responsibility to insist that all of our students reach high educational standards and receive professionalized education.

In 1990, two million American families had incomes that placed them at poverty level. Eight hundred thousand American children lived in poverty. America has twice as many children living in poverty as Canada and four times the number of children living in poverty as Western European countries.

The choice is clear: High skills or low wages. Integration of academic and vocational instruction is a key factor in improving the quality and equality of education and work for all students.

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APPENDIX A

VALIDATION LETTERS

STATE OF RHODE ISLAND
DEPARTMENT OF EDUCATION

McWalters
Commissioner

January 21, 1992

Mr. Warren Groff
1531 Peabody Avenue
Memphis, TN 38104

Dear Mr. Groff:

Ms. Beverly Lembo has worked with the Rhode Island Department of Education as an intern for the past year. She specifically has worked with us in the research of theory and practice of Integration of Academic and Vocational Instruction. She has contributed positively in many ways during the school year, during the annual summer institute, and at times when other workshops and conferences have been conducted.

I have read and reviewed Ms. Lembo's paper entitled "The Rationale for Integrating Academic and Vocational Education," and I have found it to be a worthwhile piece of work and have found it useful for providing orientation to individuals in the state's Area Centers on this very topical issue.

We will continue to work with Ms. Lembo in the future and I am sure that her studies and her work in vocational-technical education will have a positive impact on her students as well as her colleagues.

Sincerely,

John F. Keough, Jr.

John F. Keough, Jr.
Unit Manager, Area Centers Unit
Division of Vocational and Adult Education

JFK:AMD

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December 11, 1991

To Whom It May Concern:

This letter is to document that I have read and critiqued Beverly Lembo's paper on "The Rational for Integrating Academic and Vocational Education."

Having worked for the past thirty years in the field of Vocational and Technical education, I find this topic interesting and long overdue. Beverly has presented a clear and concise overview of major studies, laws and current issues that demand a new approach to all education, not just vocational education. Since vocational education has been so successful in the past as a method of teaching (learn by doing) as well as a content area, it is only natural to form some type of alliance with academic education. As Beverly points out, the new Carl Perkins Vocational and Applied Technology Education Act of 1990 emphasizes the integration of academic and vocational curriculum as the way to develop the skills needed to make the United States more competitive in the world economy. This is a broader approach than just concentrating on the vocational skills as in the past Perkins Act.

Beverly has done a thorough job of identifying the topics that rationalize the integrating of Academic and Vocational Education.

Sincerely,

Thayer Donovan

Thayer Donovan

The William M. Davies, Jr. Career and Technical High School does not discriminate on the basis of age, sex, race, religion, national origin, color or handicap in accordance with applicable laws and regulations.